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[1. g: Production of 1-Deoxyxylulose-5-Phosphate Via Enzymatic Dehydration-Reduction of Xylose-Derived Sugar](#)

Release Date: 08-12-2013Open Date: 08-12-2013Due Date: 10-15-2013Close Date: 10-15-2013

Researchers at the JBEI have generated a new synthetic pathway in cells to 1-deoxyxylulose-5-phosphate (DXP). Both routes allow more direct conversion of carbon to terpenoid compounds circumventing the typical, but inherently inefficient, route to DXP. The JBEI process results in the conservation of 17% of carbon being converted to terpenoid products. The novel pathways to DXP entail conversion of ...

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[2. h: Increased Expression of Rice Acyltransferase Genes Improves Tissue Deconstructability Without Impacting Biomass Accumulation](#)

Release Date: 08-12-2013Open Date: 08-12-2013Due Date: 10-15-2013Close Date: 10-15-2013

JBEI has identified a rice acyltransferase gene, LOC_Os06g39390, for which increased gene expression reduces ferulic acid composition. JBEI has shown that incubation with cellulases releases more sugars from plant wall leaf material with over expression of the acyltransferase compared with wild type wall material. The plants with increased acyltransferase expression exhibit little or no significant ...

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[3. i: Enhancing Fatty Acid Production by Regulation of fadR Expression](#)

Release Date: 08-12-2013Open Date: 08-12-2013Due Date: 10-15-2013Close Date: 10-15-2013

Researchers at the JBEI have developed a genetically modified host cell that increases production of fatty acids and their derivatives. Specifically, the JBEI team found that increased concentration of cellular fadR, a transcriptional factor protein that regulates genes responsible for fatty acid activation and several genes in the fatty acid degradation pathway, lowers fatty acid degradation rate ...

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[4. j: Spatially-separated Combinatorial DNA Assembly Device](#)

Release Date: 08-12-2013Open Date: 08-12-2013Due Date: 10-15-2013Close Date: 10-15-2013

Scientists at the JBEI are developing a device that can be used to efficiently assemble DNA parts, such as genes encoding enzymes, into multiple combinations, and then screen the resulting combinatorial library to identify combinations with the most desirable properties. The device combines into one microfluidic chip all of the steps necessary for this process: assembly of DNA parts; transformatio ...

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5. [k: Recovery of chemically hydrolysed biomass using solvent extraction](#)

Release Date: 08-12-2013 Open Date: 08-12-2013 Due Date: 10-15-2013 Close Date: 10-15-2013

Researchers at the JBEI have developed a technology to preferentially produce and extract sugars produced by the direct acid hydrolysis of biomass from an aqueous solution of ionic liquids such as 1-ethyl-3-methylimidazolium chloride. JBEI researchers have extracted over 80% of hexose and pentose sugars, indicating that the JBEI approach is a significant improvement in the field of biomass sacchari ...

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6. [l: Mixed Feedstock Processing using Ionic Liquids](#)

Release Date: 08-12-2013 Open Date: 08-12-2013 Due Date: 10-15-2013 Close Date: 10-15-2013

Researchers at the JBEI have developed a pretreatment technology using ionic liquids that efficiently extracts sugars from a combination of mixed feedstocks. Any ionic liquid used for biomass pretreatment or cellulose hydrolysis by thermostable cellulase may be used. Until now, no known technology could efficiently pretreat and liberate sugars from mixed feedstock streams. The JBEI technology has ...

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7. [m: Rice Os02g22380 Encodes a Glycosyltransferase Critical for Xylose Biosynthesis in the Cell Wall](#)

Release Date: 08-12-2013 Open Date: 08-12-2013 Due Date: 10-15-2013 Close Date: 10-15-2013

Researchers at the JBEI have identified a glyco-syltransferase encoded by a rice gene that is critical for xylose biosynthesis in plant cell walls. Inhibiting the expression of the gene, Os02g22380, in bioenergy plants reduces the plants lignin content, thus reducing recalcitrance of their cell walls and increasing the amount of soluble sugar that can be extracted from them. The technology is appl ...

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8. [n: Rapid Discovery and Optimization of Enzyme Solutions Using Tagged Biomass and Mass Spectrometry](#)

Release Date: 08-12-2013 Open Date: 08-12-2013 Due Date: 10-15-2013 Close Date: 10-15-2013

Researchers at the JBEI have developed a technology to create a more efficient workflow for hydrolytic enzyme discovery and enzyme cocktail optimization by providing fast, efficient analysis of native glycans using high specificity mass spectrometry-based enzyme assays. In the JBEI technology, native substrates are used for enzyme activity screening and then tagged for efficient mass spectrometry ...

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9. [o: Cell-Free System for Combinatorial Discovery of Enzymes Capable of Transforming Biomass for Biofuels](#)

Release Date: 08-12-2013Open Date: 08-12-2013Due Date: 10-15-2013Close Date: 10-15-2013

UW-Madison GLBRC researchers have developed compositions and methods that expand the ability to make, express and identify target polypeptides, including enzymes capable of enhancing the deconstruction of biomass into fermentable sugars. This approach uses a cell-free system to express enzymes and other polypeptides in a combinatorial manner. Because the system is cell-free, the enzymes can be as ...

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10. [p: Translation-Coupling Cassette for Quickly and Reliably Monitoring Protein Translation in Host Cells](#)

Release Date: 08-12-2013Open Date: 08-12-2013Due Date: 10-15-2013Close Date: 10-15-2013

UWMadison GLBRC researchers have developed a method of using translation coupling to quickly and reliably determine whether a given host is capable of expressing the gene product of any given gene. This method could be used to monitor protein translation efficiency in bacterial cells which can be very important in the discovery and screening work around producing microbes to ferment biomass-derive ...

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